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(Article begins on next page)

ENDOGENOUS POLITICAL INSTITUTIONS*

PHILIPPE AGHION

ALBERTO ALESINA

FRANCESCO TREBBI

A fundamental aspect of institutional design is how much society chooses to delegate unchecked power to its leaders. If, once elected, a leader cannot be restrained, society runs the risk of a tyranny of the majority, if not the tyranny of a dictator. If a leader faces too many ex post checks and balances, legislative action is too often blocked. As our critical constitutional choice, we focus upon the size of the minority needed to block legislation, or conversely the size of the (super)majority needed to govern. We analyze both "optimal" constitutional design and "positive" aspects of this process. We derive several empirical implications which we then discuss.

I. INTRODUCTION

Classical political theorists were well aware of the importance of the trade-off between delegation of power to leaders and the need to control them to avoid tyranny. For instance, in *Democracy In America*, Alexis de Tocqueville stressed that "Our contemporaries are incessantly racked by two inimical passions; they feel the need to be led and the wish to remain free."¹ The Founding Fathers of the American Constitution were also quite aware of this dilemma. For instance, in Federalist Paper No. 70 Hamilton writes that, "Taking for granted . . . that all men of sense will agree in the necessity of an energetic executive, it will only remain to inquire what are the ingredients which constitute this energy? How far can they be combined with those other ingredients which constitute safety in the Republican sense?" The

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1. Volume 2, part 4, Chapter 6, page 664 from the translation by Mansfield and Winthrop [2000].

theory of checks and balances, embodied in the work by Montesquieu [1748] provided the answer adopted by the framers of the American Constitution. More specifically, the question of supermajorities as a way to restrain the "tyranny of the majority" features prominently in the Constitutional theory by Hayek [1960], Buchanan and Tullock [1962], and Buchanan [1975]. The former, for instance, argues that the simple majority rule does not have any particular "superior" standing and under certain conditions may lead to excessive costs imposed on individual liberties by collective action. He argues that a "constitution of liberty" has to be based on supermajority rules and judicial control. Our emphasis on the endogeneity of institutions and how they may evolve as certain characteristics of society follows the footsteps of North [1981], the discussion of seventeenth century England by North and Weingast [1989], and the discussion of the American Constitution by Beard [1941], just to name a few.²

Given that we follow such giants, what is our contribution? We make three points. First, we provide a simple model of this trade-off between delegation of power and ex post control of politicians, that generates a number of comparative statics results in unified setup. We model delegation of power or, in one word, "insulation" of leaders as the share of votes that can block the leader ex post when he tries to implement legislation. A Constitution that establishes a high share of votes needed to "block" implies that leaders are more insulated. We show that the optimal amount of insulation depends on politico-economic features such as the size of the aggregate improvement from reform, the aggregate and idiosyncratic uncertainties over the outcome from reform, the degree of polarization of society, the individual degree of risk aversion, the availability and efficiency of fiscal transfers, and the degree of protection of property rights against expropriation. In doing so, we build upon a related framework of incomplete institutional contracts by Aghion and Bolton [2003].

Second, we contrast normative versus positive implications (as in Buchanan [1975]) and investigate the political economy of institutional design. That is, we discuss how the optimal choice of insulation would or would not be adopted in a system where the choice was not made completely behind a veil of ignorance or only a fraction of the population had a voice in the choice of institu-

2. For a vast survey of the literature on Constitutional design, see Voigt [1997].

tions. One especially interesting case is a situation in which those who choose a Constitution are also those who know who will control political office after the Constitution is ratified. In this case, what is optimal for them may not be optimal for society as a whole. In particular, we focus on the following: in a fragmented society, while it would be optimal to choose less insulation to guarantee a "voice" to all groups, in practice an especially powerful group may take a hold of the constitutional process and impose its rule. Results by Acemoglu and Robinson [2001] in the context of institutional design in unequal society are somewhat related and go in the same direction.³

Finally, we use our model as a basis for comparative cross-country analysis of constitution design. Our empirical analysis focuses on the relationship between polarization (measured by two indexes of socio-ethnic fractionalization) and various measures of insulation, e.g., whether the regime is autocratic rather than democratic, or whether it is more presidential, or whether the voting system involves majority rules instead of proportional rules. We uncover a positive and significant correlation between polarization and insulation, in accordance with the "positive" theoretical results above. Our findings, obtained on a much larger sample of countries than Lijphart [1994] contrast with this author's results. The reason is that our data set includes many more countries including developing ones (not in Lijphart's data set); in less developed democracies or semi-democracies, it is more likely that one particular group (identified by income or ethnicity) can impose undemocratic or semi-democratic rule. We also show how our model can explain why political systems in less developed economies tend to be more insulated than those with lower levels of GDP per capita, why older constitutions insulate political leaders less than more recent constitutions, and why insulation tends to increase in times of crisis or war.⁴

In moving from a "normative" model in which insulation is chosen behind a veil of ignorance to one in which some groups have more power than others at the constitutional table, we

3. These authors show how rich elites would impose dictatorship; they discuss in much more detail than we do the issue of insurrection of the poor.

4. Our contribution should thus be seen as a complement to the recent vast literature on the effects of institutions on economic outcomes, as in Persson and Tabellini [2003] and the references therein. This literature takes institutions such as electoral laws, level of democracy, presidentialism, etc. as exogenous, or at least predetermined.

connect with a recent literature on "choosing how to choose" institutional rules, or voting on voting rules.⁵

Finally, our paper is complementary to a recent lively literature that takes political institutions as exogenous (or predetermined) and studies their effects on various economic outcomes. Rodrik [1999] and Persson and Tabellini [2003] among others make a strong case for the relevance of various electoral laws and other institutions on economic outcomes. On the opposite side is work by Mulligan, Sala-i-Martin, and Gil [2004] who argue that what really matters is not the nature of political institutions but the strength of lobbies confronting each other. In fact, understanding the endogeneity of political institutions may help resolve the empirical disputes in this literature that puts institutions on the right-hand side of various regressions.

The paper is organized as follows. In Section II we describe and solve the basic model. Section III illustrates several extensions. Section IV offers interpretation and discussion of the model. Section V discusses the "political economy" of writing constitutions. Section VI highlights several empirical implications of our model and brings about empirical support. The last section concludes.

II. POLITICAL INSULATION

We begin with the discussion of optimal institutional design. First, we present and solve the basic model, and in the next section we discuss extensions.

II.A. The Basic Model

Consider an economy populated by a continuum of individuals, assumed, for the moment, to be risk-neutral with respect to income. Members of this polity will differ *ex post* on how much they benefit from policy actions (labeled "reforms") which may be implemented. If no reform is implemented, all individuals obtain

5. In particular, see Koray [2000], Barbera and Jackson [2001], and Polborn and Messner [2002]. Barbera and Jackson investigate the endogenous choice of a majority voting rule, investigating conditions of existence of a self-stable voting rule, an issue that we shall revisit below. Koray instead explores social choice functions and whether such functions are self-selecting. In an overlapping generations setting, Polborn and Messner identify a trade-off arising in the selection of voting mechanisms over a reform when only part of the population (the old) incurs the cost of the reform, but not the subsequent benefits.

the same income, which we normalize to 1. Individual income from the policy reform is given by⁶

$$(1) \quad \tilde{y}_i = \begin{cases} \tilde{\lambda}_i \gamma & \text{if reform occurs} \\ 1 & \text{otherwise,} \end{cases} \quad \text{with } \gamma > 0$$

where

$$\tilde{\lambda}_i = \lambda_i + a,$$

with λ_i uniformly distributed over the support $[\underline{\lambda}, \bar{\lambda}]$,⁷ with $\underline{\lambda} < \bar{\lambda}$ and

$$\lambda_m \equiv (\bar{\lambda} + \underline{\lambda})/2$$

is the marginal valuation for reform for the average (or median) individual in the population. We label $l = \bar{\lambda} - \underline{\lambda}$. With a we indicate a random variable with mean zero, uniformly distributed over the support $[-A, A]$, with $A > 0$. The preference shock a has to be interpreted as a change of the distribution of preferences occurring after the leader has taken office and while he is implementing his policy. This is meant to capture the idea that as a reform materializes through the effort of a leader new voters come in or the population at large "matures" definitive preferences about the reform, for instance, as they learn more precisely who will be a winner or loser from the reform.

We employ the uniform distribution to obtain simple closed-form solutions, but in the Appendix we show how our results extend to more general distributions. If $\lambda_m \gamma > 1$, the policy reform is *ex ante* efficient in the sense that it makes the average (and median) voter better off. The parameter γ allows changing the value of the reform without changing the distribution of the λ and the median voter in particular.

This community of individuals selects a leader to implement reforms.⁸ With exogenously given probability p the selected

6. The following specification builds upon Krusell and Rios-Rull [1996] and Aghion and Howitt [1998, Ch. 9] on the political economy of vested interests.

7. The constitutional decision is taken behind a veil of ignorance, before the realization of the parameter λ_i for all i 's and with all individuals facing the same status-quo outcome in case reforms do not occur, an assumption we shall relax below.

8. The role of the political leader in the basic model is highly stylized. A leader is needed to promote the reform and to pass it (unless it is blocked). However, the leader can take advantage of his position to expropriate. Obviously, if the citizens could produce reforms without a leader, expropriation would not occur. We rely on the realistic idea that a centralized entity is needed to coordinate the reform policy.

leader is "good" and promotes the reform; with probability $(1 - p)$ the leader is "bad" and only expropriates resources from the citizens.⁹ For the moment we assume that all individuals are ex ante identical in terms of their wealth, so the cost of expropriation for each individual is the same, and we label it bw where b is the exogenously given rate of expropriation and w represents individual wealth. Since we assume that w is for the moment identical for everyone, we normalized it to 1.

A (super)majority M of individuals can block the action of the leader (expropriation or reform) once the aggregate shock on preferences a is realized. We define M as the degree of insulation: if M is high, only a large majority of voters can block the reform. On the contrary, a low M means that when in office the leader is kept checked by small fractions of the electorate. Thus, a leader passes a reform only if a fraction $(1 - M)$ of the population favors it or can expropriate only if $(1 - M)$ of the population does not object to this policy.¹⁰ Note that when $M < 1/2$ then supermajorities are needed to pass legislation. Also, in order to expropriate, the leader has to "buy off" a fraction $(1 - M)$ of the population in order not to be blocked. Ex ante each individual in the polity faces probability M of being subject to the expropriation, if the latter is not blocked.

In our terminology an insulated leader can be less easily blocked, so the probability that a good reform passes is higher, but individuals are also more likely to suffer losses from expropriation. The choice of M occurs ex ante, before the realization of a , and we make the incomplete contracting assumption that the size of M cannot be made contingent upon the realization of a . Thus, we assume that the corresponding events cannot be described ex ante, and we rule out social contracts contingent upon

9. The Constitution could prohibit expropriation, but not reforms that would be a Pareto improvement. We have two comments. First, in reality it is difficult to fully restrain the authority of the government in this respect to expropriation without restricting its ability to govern in other areas. In the Federalist paper No. 73 Hamilton, for instance, elaborates on the fact that "the power of preventing bad laws includes that of preventing good ones." Second, with risk aversion, even without expropriation, we still have a well-defined trade-off between insulation and ex post control.

10. The parameter M we view as a "summary statistic" for a wide variety of institutional rules that limit the power of appointed leaders. The most direct interpretation of M is the majority that an executive has to command in order to pass legislation. In general terms the issue of the "optimal supermajority" rule is a widely debated question by Constitutional theorists. Those who favor supermajority rules (low insulation) worry about limiting the power of appointed leaders and about the tyranny of the majority. Those who oppose them view the (simple) majority rule as the essence of democracy.

messages that voters would exchange ex post about the realization of these random variables. For the moment we assume that the $\tilde{\lambda}_i$ are not observed by the politician and that the politician cannot compensate the losers, i.e., those who ex post do not want the policy reform.

The timing of "events" can be summarized as follows.

- i) M is chosen at the constitutional stage, by individuals behind a veil of ignorance, that is before the realization of the λ_i in the interval $[\underline{\lambda}, \bar{\lambda}]$;
- ii) λ_i is realized;
- iii) the politician proposes the reform or the expropriation;
- iv) the uncertainty on the distribution of ex post preferences is realized;
- v) blocking of the reform may occur, the reform is implemented if and only if it is not blocked by the voters, if the leader is "bad" he expropriates, up to the point that avoids blocking.

Stage i) represents the "constitutional level" in which decisions are made behind a veil of ignorance. Stage iii) is rather trivial. The only role of the politician is to promote a reform, that passes if not blocked, or to expropriate the citizens. Steps iv) and v) capture the postelectoral "dynamics" between leader and voters. The latter implies that after the realization of the shock a the voters still retain a choice to block ex post undesirable reforms. If the threshold for blocking M is set low, then the voters insure themselves that they will have a "voice" ex post. However, this makes reforms easily blocked. On the other hand, if M is high, reforms pass more easily, but a larger fraction of the population may be expropriated; thus, ex ante, the probability that each person is taxed is higher.

II.B. Interpretation

The real world example closest to the letter of the model would be a popular referendum on policy, an institution that is, however, seldom used. In this case the most extreme form of noninsulation would be a referendum that requires a majority of 100 percent to pass legislation, so that any individual voter can block policy. This institutional arrangement would set expropriation to zero, but would make it impossible to pass any legislation which is not a Pareto improvement ex post. Given that referendum is rarely used, in the majority of institutional settings blocking takes place indirectly, within the institutional structure of

delegation. In the case of Presidential regimes like the United States, one can view the Presidential-Congressional relationship as a key element of the system of checks and balances.¹¹ In parliamentary democracies the question of insulation refers to the control over the power of the Prime minister and the relationship between majority and minority in parliament. For given size of the parliamentary majority the power of the executive, the agenda setter, is also determined by the voting rules within the parliament, an issue that has received much discussion in the literature.¹² Various voting rules governing procedures within legislatures can be interpreted as giving more or less insulation to the executive, i.e., in most cases the "leader" who holds a majority.¹³ For example, an important distinction is one between "open rules" and "closed rules" in parliamentary voting. With open rules the legislature has a vast latitude in amending policy proposals of the agenda setter (the government); with closed rules the government can prevent amendments to its proposals, and as a result, it has a larger strategic power. One may a priori associate open rules with low insulation (low M) and closed rules with high insulation (high M), since they imply different degrees of strategic power for the executive. Similar arguments apply to "fast track" legislation in trade. This procedure is viewed in the United States as critical for the implementation of free trade agreements, which otherwise might be blocked by various special interests.¹⁴

With regard to the role of legislative institutions, a broad interpretation of M could include a comparison of different electoral rules. Proportional rules tend to produce political systems in which "governing by coalition" is the norm. In majoritarian systems, the majority party can govern with fewer constraints.¹⁵ Even more broadly, one could also use M to compare dictatorship or oligarchy versus fuller democracy. In a sense, one can think of a dictatorship as a system in which a ruler, when in office (no

11. This is a point already made by Hayek [1960]. See Alesina and Rosenthal [1995] for an extensive formal discussion of this issue.

12. See, for instance, Baron and Ferejohn [1989] and Baron [1991]. On bicameralism see Diermeier and Myerson [1995].

13. In some cases we can have minority governments, in which the executive does not command a simple majority in the legislature. See Persson and Tabellini [2000].

14. See Grossman and Helpman [2001].

15. Persson and Tabellini [2003] and Milesi-Ferretti, Perotti, and Rostagno [2002] present recent studies which compare proportional versus majoritarian systems concerning fiscal policy choices.

matter how he gets there), is uncontrolled, while an essential element of democracy is some sort of checks and balances on the politicians, above and beyond the fact that the latter are elected.

II.C. Solution of the Model

We proceed by backward induction. In stage v) the voters with low $\tilde{\lambda}_i$ oppose the reform; those with high $\tilde{\lambda}_i$ favor it. A cutoff point divides these voters:

$$\hat{\lambda} = 1/\gamma.$$

The realization of a , for given M , determines whether or not the reform passes or not. The reform will pass if and only if

$$(2) \quad (\hat{\lambda} - (\underline{\lambda} + a))/l < M$$

or $a > \hat{\lambda} - \underline{\lambda} - lM$. Therefore, ex ante the expected utility of the generic voter, who is behind a veil of ignorance, is given by

(3)

$$\max_M \left\{ p \left(\int_{-\underline{\lambda}}^{\hat{\lambda} - \underline{\lambda} - lM} \frac{1}{2A} da + \int_{\hat{\lambda} - \underline{\lambda} - lM}^A (\lambda_m + a) \gamma \frac{1}{2A} da \right) - (1-p)Mb \right\}.$$

The first two terms in (3) represent the expected benefits of the socially efficient reform (multiplied by the exogenously given probability of such an event, p), the third term represents expropriation. Note that ex ante, behind a veil of ignorance and with risk neutrality, the generic voter acts as the "average" individual. Looking first for an interior solution to maximizing (3) relative to M , and remembering that $\hat{\lambda} = 1/\gamma$, we obtain, after straightforward maximization,

$$(4) \quad M^* = \frac{1}{2} - \frac{2Ab(1-p)}{l^2\gamma}$$

whenever the right-hand side of (4) is positive. If the right-hand side of (4) is negative, then the optimal insulation level is simply $M^* = 0$.

PROPOSITION 1. The preferences of voters are single peaked on M^* , and either the optimal degree of insulation is zero or it is interior to the interval $(0,1)$ and given by (4) if positive. In the latter case, the optimal degree of insulation is decreasing with the potential loss from expropriation (b), rising with the

probability that the leader is a good (p), rising with the value of reform (γ), rising with the dispersion of idiosyncratic preferences over the reform (l), and decreasing with the extent of aggregate uncertainty over the reform (A).

First, note that in the absence of expropriation ($b = 0$), or with no bad leaders ($p = 1$), we have $M^* = 1/2$. This result follows from the utilitarian nature of the maximization problem in (3) and symmetry in the distribution of λ_i , but it extends to more general distributions of idiosyncratic and aggregate shocks on preferences, as we show in the Appendix. The basic intuition is that the representative voter *ex ante* does not want to prevent an *ex post* majority to stop an *ex post* efficient policy.¹⁶ This result also holds only with risk neutrality; as we show below under risk aversion even with no expropriation we obtain a well-defined interior solution for M^* .

That insulation should decrease in the probability $(1 - p)$ of expropriation and in the loss b from it, that is in the expected loss from a bad reform, but that it should increase in γ , the average benefit from a good reform, is self-explanatory.

Finally, to understand why insulation is increasing in l (respectively, decreasing in A), first note that in the absence of expropriation, optimal insulation should not depend on l or A . This follows from the fact that increases in l and A do not affect the marginal effect of M on the outcome from good politician. However, an increase in l (respectively, in A) increases (respectively, reduces) the average outcome under a good politician by increasing (respectively, reducing) the likelihood of reform. Since an increase in l (respectively, in A) does not affect the average (expropriation) outcome under a bad politician, the higher l (respectively, A) the higher (respectively, lower) the benefit of insulation relative to its expropriation cost, and therefore the higher (respectively, lower) the optimal level of insulation.

These parameters can all be connected to the real world. In particular, a high b or a low p captures economic environments with poor legal protection of individuals' property rights and wealth. A high γ captures the case of economies with a high aggregate value of reform, e.g., emerging market economies that require stabilization or transition economies that require structural market reforms. Also a country that precipitates in a "crisis"

16. See the Appendix and Rae [1969].

may have a very high value for a reform that eliminates the source of distress. A high A corresponds typically to reforms such as international treaties or constitutional change, that involve a high degree of aggregate risk and irreversibility. Proposition 1 thus suggests that insulation should be higher in economies with better legal protection, or facing an emergency or transition situation, or for decisions that involve a limited amount of aggregate risk or are easily reversible. In the next section we complete this comparative statics by introducing polarization, risk aversion, and compensation costs as additional determinants of insulation.

III. EXTENSIONS

III.A. Risk Aversion and Polarization of Preferences

Let us now add a very simple form of risk aversion, with ex post individual utilities being given by

$$(4) \quad u(y_i) = \begin{cases} y_i & \text{if } y_i \geq \theta, \\ y_i - u & \text{otherwise,} \end{cases}$$

where y_i is ex post income and where $u > 0$. Thus, only if income is above a threshold θ , do we have the same utility as in the basic model; otherwise, the individual incurs a loss. We assume that the status quo outcome is always above such a threshold (i.e., $\theta < 1$) linking more tidily risk aversion and reform. Moreover, for simplicity we take the probability of a bad reform to be zero; i.e., $p = 1$. This also shows an important result: with risk aversion one obtains a well-defined interior solution for M^* even without expropriation; that is, even when property rights are fully protected.

In this case the optimal choice of M becomes

$$(5) \quad M^* = \frac{\gamma l(\lambda_m - \underline{\lambda}) + u(1 - \theta)/\gamma - 2Ab(1 - p)/p}{(\gamma l + u)l}.$$

This implies the following.

PROPOSITION 2. The optimal degree of insulation (M^*) declines with the risk aversion parameter (u).

Proof. See Appendix.

Thus, more risk aversion leads to lower insulation: in choosing insulation, ex ante the voter takes into account the risk of

falling below θ ex post. Thus, more risk aversion leads to choosing a system where ex post policy reforms can be more easily blocked.¹⁷

Let us now examine the effect of polarization of preferences. For simplicity, we introduce a very stylized form of nonlinearity in the preference distribution, namely, we assume that a point mass $\Delta(\leq 1)$ is now added to the lower extreme of the distribution's support $[\underline{\lambda}, \bar{\lambda}]$. The mean point of the distribution becomes $\Delta \underline{\lambda} + (1 - \Delta) \lambda_m$. With risk aversion and polarization we obtain the following key result.

PROPOSITION 3. For a sufficiently large degree of risk aversion as measured by u , more polarization (Δ) reduces the optimal degree of insulation, whereas for low risk aversion more polarization increases the optimal degree of insulation.

Proof. See Appendix.

The intuition for this result is straightforward: on the one hand, more polarization increases the risk of ending up at the bottom of the preference distribution, which in turn leads to a utility loss when the reform is implemented; reducing insulation will limit that risk; on the other hand, more polarization increases the probability of a reform being blocked by the lower tail of the preference distribution and increasing insulation helps neutralize the lower tail. This result rationalizes the fact that in more polarized societies with highly risk-averse individuals, the Constitution "should" imply less insulation, to avoid the risk of being, ex post, unsatisfied with the insulated ruler. We stress the word "should" because this result follows from a Constitutional decision process in which everybody is behind a veil of ignorance. As we will discuss below, this result may not apply in a situation in which not everybody is behind a veil of ignorance at the Constitution table.

17. Note that the critical assumption that drives this result is that there is "risk" about the outcome of the reform for an individual voter, but no risk about the status quo. This is a realistic assumption to the extent that one knows its own status quo, but not the outcome of a possibly complex sequence of policy changes. Yet one might think about the reverse situation. Think, for instance, about the introduction of unemployment insurance, in which case the reform is meant to remove uncertainty of outcomes. In this case the effect of risk aversion would be reversed.

III.B. Compensation

In general, those who are net losers from a policy reform can be compensated by transfers, even though the latter will generally induce welfare costs, such as the costs of distortionary taxation. Suppose that after M is chosen, a fixed amount of resources ω can be raised from all individuals through taxes, and assume for simplicity that taxes are raised before the idiosyncratic and aggregate shocks on preferences are realized. Note that this implicitly assumes that any increase in income obtained through the reform cannot be used to compensate losers, since the amount available for compensation is fixed *ex ante*. The maximum amount of ω is 1 which represents initial individual wealth. The only purpose of taxation is to compensate losers for the reform, which means that if the available resources for compensation exceed the needs the resources in excess are returned lump sum at no cost and the leader does not retain any revenue for his own consumption.

Such a transfer scheme is assumed to involve a positive deadweight cost k per unit of taxed funds, and the net tax revenues are used by the politician to compensate the required number of losers in order to avoid blocking. *Ex post*, for given realization of the aggregate shock a , either more than $(1 - M)$ individuals are willing to support the reform even without any compensation (this will be the case whenever $(\hat{\lambda} - a - \underline{\lambda})/(\bar{\lambda} - \underline{\lambda}) < M$), in which case no compensation will take place; or passing the reform requires compensation to be made (this will be the case when $(\hat{\lambda} - a - \underline{\lambda})/(\bar{\lambda} - \underline{\lambda}) > M$): then the politician needs to compensate the fraction $(\hat{\lambda} - a - \underline{\lambda})/(\bar{\lambda} - \underline{\lambda}) - M$ of individuals for potential loss of utility due to the reform). Compensation is paid to enough individuals who would, *ex post*, vote against the policy reform, in order to keep them in. Obviously, the "cheaper" individuals are compensated, i.e., those closer to the cut-off point of indifference between having or not having the reform. However, this requires that individual preferences be *ex post* observable, since compensation is made dependent on those preferences.¹⁸

Thus, the total amount of compensation needed to pass a reform is given by

18. The case where individual preferences are not publicly observable can be analyzed along the same lines as in Aghion and Bolton [2003].

$$c(a) = \int_{\lambda+IM}^{\hat{\lambda}-a} \gamma(\hat{\lambda} - a - \lambda_i) \frac{1}{l} d\lambda_i.$$

Two cases must be considered. The first case is when there are enough funds in the compensation scheme so that the reform will always take place no matter what the realization of a is. In this case reform will always take place (as it will always be affordable) and, at the constitutional stage behind a veil of ignorance, the generic individual will choose M^* in order to maximize

$$\max \{p(\lambda_m \gamma - kE_a c(a)) - (1-p)bM\},$$

where $E_a c(a)$ is the expected compensation cost. The second case is when not enough resources can be raised to fully compensate losers. In the Appendix we show that in either case,

PROPOSITION 4. When the compensation scheme is available and k is not too large, the optimal degree of insulation M^* increases with the taxation cost k ; otherwise it satisfies the same comparative statics properties as in Proposition 1.

The basic message of this proposition is that a less efficient system of transfers should lead to higher insulation (higher M) in order to reduce the need for compensation ex post.

IV. THE POLITICAL ECONOMY OF CONSTITUTIONS

Thus far, we have examined the case of a "perfect veil of ignorance," behind which everybody is identical. This, in a sense, is equivalent to a normative model of constitutional writing. In reality, Constitutions are not written by social planners, and veils of ignorance have large holes in them. In fact, in virtually every instance of Constitutional reform, a large amount of bargaining and conflict occurs at the Constitutional table. One simple way of capturing the complexity of the political economy of writing Constitutions is to generalize our model by assuming that not everybody derives the same (known) utility from the reform. The analytical structure that we have developed above allows us to extend the analysis in this direction fairly easily. From the point of view of empirical applications, a discussion of the political economy of Constitutional design, that is, an analysis of deviations from optimality criteria, is critical.

IV.A. *Wealth Distribution, Voting Rights, and Constitutions*

For example, assume that individuals differ *ex ante* with regard to their taxable wealth, namely a " w_i -individual" expects to be expropriated by an amount equal to $(1 - p)bw_iM$ on average. We have already seen in Proposition 1 that the optimal degree of insulation is negatively correlated with the scope for expropriation. Then it immediately follows that an individual i with higher w_i at the Constitutional stage will optimally choose a lower level of insulation, with

$$(6) \quad M^*(w_i) = \frac{1}{2} - 2Abw_i \frac{1-p}{p},$$

and that individual i 's preference for insulation is single peaked around this maximum. This in turn has interesting implications for the political economy of Constitutional writing. Consider a symmetric distribution of expropriation losses w_i between \underline{w} and \bar{w} and suppose that the Constitution is decided by majority rule. In this case, the median voter, w_m will prevail and impose her most preferred level of insulation; namely,

$$(7) \quad M^*(w_m) = \frac{1}{2} - 2Abw_m \frac{1-p}{p}.$$

Alternatively, if M had to be chosen by unanimity, any $M > M^*(w_m)$ would be vetoed by wealthy individuals. Allowing bargaining at the Constitutional table will make Constitution design ultimately depend on bargaining rules and the distribution of wealth.

Another example of interest is the writing of Constitutions by a minority of wealthy individuals who might worry about the possibility that new redistributive policies might be introduced by future majorities as the extension of voting rights progresses over time. In his economic interpretation of the American Constitution, Beard [1941], and many followers after him, argue that the critical preoccupation of the Founding Fathers was exactly this one. An important aspect of insulation concerns the protection of property rights against expropriation. James Madison, in particular (see Federalist Paper No. 51), advocated separation of power as a way of preventing an "overbearing majority" to become tyrannical vis-à-vis the minority. He clearly identifies the minority with that of wealthy men threatened by the majority of the poor. This implies that older Constitutions, chosen when voting

rights were restricted to a fraction of wealthy men, should prescribe larger majorities (i.e., be less insulated) when it comes to taxation and protection of property against redistributive reforms. To put it differently, older Constitutions would make it easier to block legislation that threaten property, a point emphasized by Alesina and Glaeser [2004] as an explanation of the difference between the American and European Constitutions and the associated differences in welfare states. Acemoglu and Robinson [2001] also investigate the redistributive motive as a pivotal element of constitutional design and transition between democracy and autocracy.

In the language of our model this can be interpreted as follows. Suppose that individual wealth is heterogeneous across individuals and distributed between w and \bar{w} with density $f(w)$. Suppose also that the expropriation rate is the same b for all individuals, and that those who decide on the Constitution lie in the upper part of the wealth distribution, say between some w^h and \bar{w} , with $w^h > w$. Assuming that all individuals with wealth $w \in [w, \bar{w}]$ vote ex post, clearly the Constitution designers will choose a lower degree of insulation than if the franchise was not to be extended. In other words, Constitutions written with an eye on defending property rights against future redistribution of expropriation will include a number of checks and balances and require supermajorities, i.e., low insulation to pass legislation. These checks and balances will be targeted especially toward making it easy to block legislation against redistribution and taxation of wealth.¹⁹

IV.B. Constitutional Choice by the Upper Tail

Consider a situation in which a minority who chooses the Constitution also knows that it will always be able to appoint leaders. For example, suppose that a minority of high λ individuals, with $\lambda \in [\bar{\lambda} - \varepsilon, \bar{\lambda}]$, and $\bar{\lambda} - \varepsilon > \underline{\lambda}$, choose the constitution. First, the minority will choose a higher M than the rule that emerges under the veil of ignorance; that is, it will choose to have more insulated leaders. In the most extreme example where the minority is a singleton, one absolute dictator will "choose" $M = 1$, which in turn will allow him to pass any legislation he will like ex post. Second, the lower ε , the more likely it is that the (upper tail)

19. Acemoglu and Robinson [2000] and Lizzeri and Persico [2004] investigate what leads wealthy minorities to extend the franchise.

minority who chooses the constitution, will react to increased polarization of preferences by increasing insulation, as this minority is less subject to the risk of ex post utility losses than the average individual in the population; thus, from the point of view of constitution writers in the minority the main concern is that polarization increases the probability of a reform being blocked by the lower tail of the preference distribution, and as we stressed in Proposition 3 above increasing insulation helps reduce this blocking power by the lower tail.

More formally, we can show the following.

PROPOSITION 5. Suppose that the insulation rule M is decided at the constitutional stage by a minority of individuals who know that their idiosyncratic preference for reform is distributed on the interval $[\bar{\lambda} - \varepsilon, \bar{\lambda}]$. Suppose in addition that a mass $(1 - \Delta)$ of individuals are uniformly distributed over the interval $[\underline{\lambda}, \bar{\lambda}]$, with a discrete mass Δ of them being located at the lower extreme of that preference interval. Then, we have (1) the lower ε , the higher the optimal insulation rule M_ε chosen by this minority; (2) for ε sufficiently small, M_ε increases with polarization Δ , no matter the degree of risk aversion as measured by u .

Proof. See the Appendix.

The implication of this proposition is clear: when a minority chooses the Constitution and knows that it will rule under this constitution, it will choose more insulation, and in this case more polarization leads to more insulation.

IV.C. Choosing How to Choose

If voters are not identical ex ante at the constitutional table, then the question is which rules "should" and will be used to choose a Constitution. That is, we have both a normative and a positive question of voting rules at the Constitutional table.

One might think of some sort of "fixed point" argument in voting rules; that is, one may want to argue that a choice of M^* has to be approved itself with a blocking rule M^* . That is, a Constitutional choice of M^* can be vetoed only by a M^* (super)-majority. This is exactly the approach taken in models by Barbera and Jackson [2001] and Polborn and Messner [2002]. While this self-stable solution is very elegant, its realism may be called into question. In fact, voting rules and procedures to select or change

the Constitution are generally different from the rules regulating the passage of "normal" legislation. In general, the blocking coalitions needed to prevent changes in the Constitution are lower than those required to block "normal" legislation. In fact, our model, and more specifically subsection IV.B. on risk aversion, suggest one possible reason why changing the Constitution would require smaller blocking coalition (larger majorities): Constitutional change may bring about a more uncertain distribution of winners and losers, and voters may be especially risk averse concerning radical changes of the rules of the game. Another commonly discussed reason is the need to prevent an elected leader from "easily" changing the rules of the game restricting democratic rules in favor of the leader himself.

V. EMPIRICAL IMPLICATIONS AND DISCUSSION

In what follows, we discuss several empirical implications of our theoretical analysis. Rather than formally "testing" our model, we highlight several of its implications that seem to shed light on some aspects of institutional choices and economic development. In the previous sections we have discussed both normative and positive aspects of constitutional design. As it is often the case in policy analysis, one can take the normative case as a benchmark to analyze and interpret the actual evidence on Constitutional design.

V.A. Economic Development and Institutions

A well-known feature of developing countries is that they do not have well-functioning fiscal systems. The share of transfers of GDP is larger in OECD countries than in developing countries, and more generally, the role of government in transferring resources across individuals, the welfare state, is far more widespread in richer countries. In the 1990s the average level of subsidies and other current transfers as a percentage of current expenditure in the high-income countries sample [World Development Report 2000–2001, World Bank] was about 60 percent. In lower middle income countries it was 18 percent in 1990 and 26 percent in 1997. Part of the reason is that it is easier to collect taxes in more advanced industrial countries and also targeting compensation toward the truly deserving is particularly difficult. These considerations suggest that developing countries should adopt more insulated systems of government, since, in the language of our model they have a higher k .

On the other hand, property rights tend to be less well protected in developing countries, and insulated leaders may have more latitude to pursue policies which favor the leader himself and its close allies. The potential for "expropriation," broadly defined, is larger in developing countries. This is captured by a higher b in our model. One may argue that the technology for expropriation and that of taxing for compensation go hand in hand, to the extent that they both involve collecting fiscal revenue. However, a compensation scheme involves a fairly sophisticated system of targeting, while expropriation, especially in its more brutal form, can be rather easy to accomplish to the extent that the government has the monopoly of coercion, a monopoly that will itself increase with more insulation.

These considerations put developing countries between an institutional rock and a hard place. High insulation leads to high expropriation. Low insulation means that policy reforms are not implemented. In fact, we believe that this "steep" trade-off between the possibility of implementing reforms with winners and losers and the likelihood that insulated leaders turn into dictators, may be one of the key reasons for institutional failures in developing countries.

A related point concerns the well-known fact that richer countries tend to be more democratic. Note that richer countries have better functioning fiscal systems, which allows for transfers and social insurance, features that can be interpreted as a lower k in our model, that is, lower costs of compensation. This reduces the need for insulation and allows for better protection against socially inefficient reforms. A more stringent implication is that countries with lower costs of taxation or better functioning welfare states should have lower insulation. Interestingly Milesi-Ferretti, Perotti, and Rostagno [2002] and Persson and Tabellini [2003] find that more proportional electoral systems are associated with a larger share of transfer payments. Proportional electoral systems (as opposed to majoritarian) can be thought of as systems with low insulation since they often require large coalition governments to govern. These authors interpret causality from the electoral systems to the welfare state; in this paper we suggest that the alternative direction of causation may also be present.

V.B. Polarization, Fragmentation, and Institutional Choice

An especially relevant question is what institutions are more appropriate for more or less polarized or fragmented societies, a

preoccupation that goes back at least to the Founding Fathers. From a "normative" point of view the above Proposition 3 suggests that more polarization, that is, a higher scope for excluding a subset of the population from the benefits of reform, should lead to the adoption of a lower level of insulation if constitution writers are sufficiently risk averse and choose under the veil of ignorance, as lower insulation provides more checks and balances and avoids permitting any group to impose its insulated authority on all the others. In his analysis of advanced democracies Lijphart [1994] argues that this is indeed the case. However, we have shown in Proposition 5 that when constitution writers belong to a privileged minority far from the "veil of ignorance" ideal of normative models, the opposite implication should hold: in more polarized, fragmented societies one should observe more rather than less insulation.²⁰

We now test the relationship between polarization and insulation in a vast sample of countries. Measurement issues are complex. They affect both our independent and dependent variables. It is almost impossible to construct an undisputable measure of "insulation" for a sample of more than a hundred countries in which institutional arrangements vary on many dimensions. In our model insulation is an *ex post* control of the voters over policy-makers. In practice, this type of control, as we discussed above, can take many different forms. For this reason, we shall consider different empirical proxies for insulation.

To measure polarization, we consider several indices of ethno-linguistic fractionalization, which we take as reasonably exogenous, and have been widely used in the empirical literature.²¹ Ideally, we would like to have a direct measure of polarization of the distribution of gains or losses from reform across voters. Constructing such a measure would require that we identify the size of the groups that are *ex ante* more likely to be damaged by the reform process. However, our cross-country data only provide information on the relative size of ethnic groups. Thus, to link our theory to our empirical analysis, we need to make the assumption that the extent of ethnic divisions is positively correlated with the likelihood of a polarized distribution of gains from the reform process.

The formula for the fractionalization index in country i is

20. In Aghion, Alesina, and Trebbi [2004] we explore these issues in the context of the choice of forms of government of American cities.

21. See, for instance, Easterly and Levine [1997], La Porta et al. [1998], Alesina et al. [2004], and Montalvo and Reynal-Querol [2002].

$$FRAC T_i = 1 - \sum_{j=1}^J \left(\frac{n_{ji}}{N_i} \right)^2,$$

where n_{ij}/N_i is the relative size of group j in country i , with $j = 1, \dots, J$. As for the data used, the first index is the one used originally by Easterly and Levine [1997].²² It is an ethno-linguistic fragmentation index based on a historical Russian classification of languages in 1960. The second and third fractionalization indices have been constructed by Alesina et al. [2004] by disentangling linguistic measures from other ethnic variables, like racial origin. We will employ a measure for ethnic fragmentation and another measure for linguistic fragmentation.

We also check our results by using the polarization index proposed in Esteban and Ray [1994] and applied also by Montalvo and Reynal-Querol [2002]. This index is computed as follows:

$$POL_i = K \sum_{j=1}^J \sum_{k=1}^J \left(\frac{n_{ji}}{N_i} \right)^{1+\alpha} \left(\frac{n_{ki}}{N_i} \right) d,$$

where K and α are constant, and we assume distance among ethnic groups $d = 1$ if $j \neq k$, 0 otherwise. Esteban and Ray do not estimate the main parameter α in their model. However, they show that $\alpha \in (0, 8/5]$. We pick the mean value $\alpha = 4/5$, which is also indicated by the authors as being a reasonable choice (close to 1). Intuitively, the difference between these two indices of fractionalization and polarization is that, while the former increases monotonically with diversity, the latter measures the distance from a bimodal distribution of groups. Basically, according to the polarization index the largest value of the index (max polarization) is reached when two equally sized groups face each other. In the fractionalization index the max value of the index is reached when many small groups (in the limit one person one group face each other).²³

In Table I we describe all the data used in the following tables including their sources. In Table II we present some descriptive sample statistics. The first proxy for insulation is a

22. A second "traditional" index (labeled AVELF) is an index proposed by Easterly and Levine [1997] which averages over five related linguistic indices. All the following results are robust to the use of this alternative index, and we do not report them.

23. See Montalvo and Reynal-Querol [2002], for a detailed discussion.

simple dichotomy: democracy versus autocracy. A dictator is the most insulated leader of all. The second measure refers to democratic forms of government, and we assign to Presidential systems the role of "most insulated" form of government, Semi-Presidential (or Hybrid) the middle level—not reported—and Parliamentary systems the least insulated. This choice is justified by the substantial reduction in the number of veto players within Presidential systems and their intrinsic winner-take-all nature, which distinguishes them from Parliamentary systems.²⁴ The unconditional correlation between the form of government from Presidential to Semi-presidential to Parliamentary and the Freedom House index of political freedom is $-.51$, significant at the 1 percent level, for the sample of countries used below. That is, more Presidential regimes are associated with lower political rights, which we interpret as a proxy for more insulation.²⁵ Notably, one can identify an analogue winner-take-all nature in electoral rules. For example, first-past-the-post formulae in Plurality systems may act as instruments of insulation of the elected politicians from the minority of the electorate. This is the third proxy we present. Table II shows that for all cases more fractionalized regimes are more insulated. For instance, more fractionalized systems are less democratic, more presidential, and tend to have more Plurality rules.

In Table III we present Ordered Probit regressions where the dependent variable is the Freedom House autocracy index in 1990. This table shows that the correlations indicated in Table II survive after controlling for several other institutional and economic variables. Without controlling for real GDP per capita, the fractionalization variables are statistically significant at the 1 percent level in explaining the probability of ending up in a more autocratic regime. GDP per capita may be endogenous; however, in three out of four cases the fractionalization variable remains significant at standard levels, even after including together with GDP a large set of controls (not reported, but available from the

24. For example, there is a relevant, negative (-0.501), and significant (at the 1 percent level) correlation between presidentialism and a measure of political constraints within the political arena (as presented in Henisz [2002]). For more discussion on insulation and presidentialism, see Shugart and Carey [1992].

25. Further analysis shows that this correlation holds up even when controlling for a battery of other variables, including log of per capita GDP, school enrollment ratios, regional dummies, and openness.

TABLE I

Variables Definitions:

-
- Ethnic Fractionalization: Ethnic Fractionalization Index from Alesina et al. [2004]; construction is described in the text.
- Ethno-Linguistic Fractionalization Index in 1960: ELF from Easterly and Levine [1997]. The original source is the 1964 Atlas Narodov Mira for the year 1960.
- Polarization: Measure constructed applying Esteban and Ray [1994] to the Alesina et al. [2004] ethnic measure, $\alpha = \frac{1}{2}$.
- Linguistic Fractionalization: Linguistic Fractionalization Index from Alesina et al. [2004].
- Autocracy: Ordinal variable based on Freedom House [2002] Index in 1990. Free = 1, Partly Free = 2, Not Free = 3. The ranking increases in the degree of insulation of the Executive.
- Separation of Powers: Ordinal variable from the Database of Political Institutions [2001], available from DATAVINE/Harvard CID and the World Bank [Beck et al. 2000] for year 1990. We consider the variable SYSTEM, complemented to 2 to facilitate exposition. Direct Presidential is assigned 2, Hybrid-Presidential = 1, and Parliamentary = 0. The ranking increases in the degree of insulation of the Executive.
- Executive Constraints: Measure of operational (de facto) independence of the Chief Executive. From Polity IV data set. Ordinal, from 1 = minimum degree of constraint to 7 = maximum degree of constraint. Average over 1990–1994 period for variable XCONST. The ranking decreases in the degree of insulation of the Executive.
- Powers of the Presidency: For columns (1)–(5) is Powers of the Elected President from Shugart and Carey [1992, Ch. 8], dependent variable for (6)–(10) includes only nonlegislative powers (as oppose to legislative). High nonlegislative powers imply high insulation of the Executive. The NCSEER data expand the sample to post-Soviet Hybrid-Presidential countries and conform to Shugart and Carey's criteria. The ranking increases in the degree of insulation of the Executive.
- Plurality: MAJ Dummy for plurality rule and majority systems (1 = Plurality, 0 = Proportional representation, mixed system or other). From Persson and Tabellini [2003] variable MAJ. The ranking increases in the degree of insulation of the Executive.
-
- Control Sets:
- Legal origin: French, Socialist, and other non-Common Law legal origin from La Porta et al. [1999]; the Social legal origin dummy is dropped when ELF is used, as non-Socialist countries were included in the original study.
- Regional dummies: Sub-Saharan Africa, East Asia, and Latin America.
- Colonial origin dummies: British, French, Spanish/Portuguese, other colonies; from CIA World Factbook [2001].
- Religion: Continuous variable indicating fraction of the total population that is Protestant, Catholic, or Muslim, from La Porta et al. [1999].
- Log(Real GDP) in 1960: Natural logarithm of real GDP per capita in 1960 from Easterly and Levine [1997].
-

TABLE II
SAMPLE MEANS

Sample: DEMOCRACY					
Variable	Obs	Mean	Std. dev.	Min	Max
Ethnic Fractionalization Index	69	0.30999	0.22927	0.002	0.7872
Ethno-Linguistic Fractionalization Index 1960	46	0.28522	0.24319	0	0.82
Polarization ($\alpha = 4/5$)	69	0.12976	0.08185	0.001	0.2723
Linguistic Fractionalization Index	66	0.27273	0.24297	0.0021	0.8734
Sample: PARLIAMENTARY					
Variable	Obs	Mean	Std. dev.	Min	Max
Ethnic Fractionalization Index	50	0.29523	0.21684	0.0119	0.8082
Ethno-Linguistic Fractionalization Index 1960	38	0.30158	0.25149	0.01	0.89
Polarization ($\alpha = 4/5$)	49	0.12939	0.08189	0.006	0.2692
Linguistic Fractionalization Index	46	0.3079	0.2447	0.0111	0.8141
Sample: NONPLURALITY					
Variable	Obs	Mean	Std. dev.	Min	Max
Ethnic Fractionalization Index	67	0.37671	0.25062	0.0119	0.8791
Ethno-Linguistic Fractionalization Index 1960	59	0.32593	0.27512	0.01	0.89
Polarization ($\alpha = 4/5$)	66	0.14849	0.08195	0.006	0.279
Linguistic Fractionalization Index	64	0.32198	0.28145	0.0124	0.8652

authors).²⁶ In columns (1)–(8) we alternatively control for legal and colonial origin, geographical, and religious characteristics of each country; in column (9) we control, as mentioned, for income levels (we try to reduce the endogeneity issue by taking 1960 levels). Usually, the control sets we employ show a joint significance well into the critical region, and we note (although not

26. The results in Table II differ slightly from those reported by Barro [1996]. Using a different sample and a different set of controls, he finds that his measure of ethnic fractionalization has the same sign as ours in a regression explaining a democracy index, but it is not significant. In fact, this author finds that almost nothing except level of per capita GDP affects his democracy index. However, many of his controls could be endogenous.

TABLE II
(CONTINUED)

Sample: AUTOCRACY					
Variable	Obs	Mean	Std. dev.	Min	Max
Ethnic Fractionalization Index	41	0.5711	0.24783	0.0392	0.9302
Ethno-Linguistic Fractionalization Index 1960	20	0.58	0.32216	0.01	0.93
Polarization ($\alpha = 4/5$)	41	0.17759	0.0614	0.0201	0.2739
Linguistic Fractionalization Index	38	0.50847	0.2881	0.0028	0.9227
Sample: DIRECT PRESIDENTIAL					
Variable	Obs	Mean	Std. dev.	Min	Max
Ethnic Fractionalization Index	68	0.54252	0.26042	0	0.9302
Ethno-Linguistic Fractionalization Index 1960	55	0.48455	0.30358	0.01	0.93
Polarization ($\alpha = 4/5$)	68	0.17862	0.07225	0	0.279
Linguistic Fractionalization Index	65	0.46227	0.31572	0.0103	0.9227
Sample: PLURALITY					
Variable	Obs	Mean	Std. dev.	Min	Max
Ethnic Fractionalization Index	42	0.48886	0.25831	0	0.8635
Ethno-Linguistic Fractionalization Index 1960	36	0.5125	0.271	0.01	0.93
Polarization ($\alpha = 4/5$)	42	0.1755	0.07478	0	0.2774
Linguistic Fractionalization Index	40	0.45338	0.30719	0.0103	0.8983

Variables are defined in Table I. The table reports number of observations, the mean, the standard deviation, and the minimum and maximum values within the subsamples reported for different indicators of fractionalization. Democracy refers to the classification of "Free" by Freedom House, Autocracy of "Not Free."

report) that French legal origin and Socialist legal origin are associated with less democracy relative to the Anglo-Saxon system (the omitted category). With few exceptions, fractionalization seems to increase the probability of ending up in a more autocratic (and more insulated) regime.²⁷ Finally, with reference to the potential endogeneity of ethnic fractionalization with respect

27. It should be noted that many of these control sets are correlated with each other. Adding all the possible controls in the same regression causes two main problems: collinearity and a reduction in the sample size. We verified both problems as being relevant. We tested simultaneously for all the possible controls and observed a reduction in the precision of the estimate for fractionalization as well as a loss of significance for a large majority of the controls.

TABLE III
AUTOCRACY AND POLARIZATION

	ORDERED PROBIT			
	(1) Autocracy (1990)	(2) Autocracy (1990)	(3) Autocracy (1990)	(4) Autocracy (1990)
Ethnic Fractionalization Index	1.926 (0.355)*** [174]	2.021 (0.390)*** [163]	1.700 (0.418)*** [174]	1.434 (0.448)*** [163]
Ethno-Linguistic Fractionalization Index 1960	1.678 (0.421)*** [107]	1.625 (0.450)*** [107]	0.526 (0.481) [107]	0.383 (0.499) [107]
Polarization ($\alpha = 4/5$)	4.229 (1.148)*** [174]	3.387 (1.226)*** [163]	4.112 (1.173)*** [174]	2.854 (1.296)** [163]
Linguistic Fractionalization Index	1.395 (0.309)*** [168]	1.576 (0.333)*** [157]	0.681 (0.365)* [167]	0.562 (0.396) [156]
Control sets				
Legal origin		Included [0.005]		Included [0.000]
Regional dummies			Included [0.002]	Included [0.000]
Colonial origin				
Religion				
Log(Real GDP) in 1960				
Marginal effect at mean from partly free to not free status	0.553	0.478	0.469	0.297

to insulation, note that the bias should go against finding these correlations. In fact, more insulated and less democratic systems should be those more likely to engage in active policies toward reducing fractionalization, such as expulsion of minorities, genocide, etc. A more subtle problem of endogeneity concerns the case in which individuals self-classify themselves in certain ethnic or racial groups as a function of the feature of the institutional

TABLE III
(CONTINUED)

ORDERED PROBIT				
(5) Autocracy (1990)	(6) Autocracy (1990)	(7) Autocracy (1990)	(8) Autocracy (1990)	(9) Autocracy (1990)
1.866 (0.383)*** [146][146]	1.506 (0.455)*** [145]	1.743 (0.386)*** [145]	0.982 (0.463)** [109]	1.700 (0.513)***
1.545 (0.422)*** [107]	0.678 (0.464) [107]	1.654 (0.443)*** [107]	0.429 (0.475) [107]	0.731 (0.457) [103]
4.281 (1.226)*** [146]	3.637 (1.272)*** [146]	3.031 (1.251)** [145]	1.630 (1.377) [145]	3.995 (1.608)** [109]
1.436 (0.316)*** [141]	0.668 (0.395)* [140]	1.431 (0.339)*** [140]	0.458 -0.417 [139]	1.140 (0.453)** [106]
Included [0.002]	Included [0.026] Included [0.014]	Included [0.000]	Included [0.001] Included [0.000]	Included [0.000]
0.453	0.344	0.402	0.199	0.231

Variables are defined in Table I. Each column in the table reports Ordered Probit coefficients, robust standard errors (in parentheses, below coefficient estimates), and number of observations (in brackets, below) for the measures of polarization in society described in Table I. The table includes *p*-values for Chi-square test of joint significance of the control sets described in Table I. The marginal effects and *p*-values reported refer to the specification employing the Ethnic Fractionalization Index of Alesina et al. [2004]. * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent.

system, for instance, because certain groups or others are more or less favored.

From the coefficients reported in Table III one can compute the marginal effects on the probability of a political system of being less democratic. The marginal effect of ethnic fractionalization on the probability of ending up in the less democratic group for a country already partly lacking political freedom is about

0.38 on average. Including income, the size of the marginal effect is almost halved, but remains quantitatively important. This seems to suggest not only that fractionalization seems to explain insulation, but also that it has a quantitatively large role.

In summary, there seems to be evidence that in more ethnically fragmented societies, political systems are less democratic. We find this result interesting because two strands of cross-country empirical literature have independently emphasized the effect of ethnic fragmentation on economic outcomes and the effect of presidentialism and democratic status on politico-economic outcomes. These results seem to suggest that the two sets of variables, institutions, and racial fragmentation are not independent from each other. Our interpretation, consistent with our model, is that in more fragmented systems, political systems are chosen to insulate certain groups and prevent others from having a voice.

Table IV moves a step forward in focusing on institutional details and mapping insulation into specific political systems' features. The table repeats the analysis in Table III for Presidential regimes now, focusing on the issue of Separation of Powers (i.e., insulation of the Executive from the Legislative Power). In Table III the effect of all measures of fragmentation is strong and highly significant if we exclude income from the specification (columns (1)–(8)), even after employing a wide range of controls. The individual effects are not reported, but we note that French legal origin and Socialist legal origin are associated with more Presidential regimes relative to the Anglo-Saxon system, which is the omitted category.²⁸ When we control for income, the effect of fractionalization becomes weaker and in some specifications loses significance at standard confidence levels. However, the size of the marginal effects never falls below .38. Table V maintains the same focus as Table IV, i.e., investigates insulation in terms of the characteristics of the Executive Power. We concentrate here on an index of intensity of the constraints on the *de facto* independence of the Chief Executive in different systems as another measure of insulation/delegation. Although the results are less robust to changes in the specification than in Table IV, it is still the case that the expected correlations between fractionalization and insulation hold. More fractionalized countries appear associated with lower levels of constraints for their

28. In some specification the impact of polarization/fragmentation appears weaker, but this is mostly due to the inclusion of an irrelevant set of controls, as shown by the Chi-square tests reported. This seems to be the case, for example, in columns (4) and (6) with respect to regional dummies. It may also, *ex post*, explain the weakness of specification (3).

Chief Executive. Table VI provides an analysis of the role of polarization and fractionalization within the form of government. It reports results related to Presidential regimes, gaining focus on characteristics highlighted in Tables IV and V. Within Presidential regimes there are evident differences in the degree of control by the elected president over both legislative and nonlegislative processes. Shugart and Carey [1992] provide an insightful analysis of the issue and a taxonomic framework as well. As we interpret a more powerful president as a more insulated one, we expect to find that more polarized countries are also characterized by a more powerful president. Moreover, we would expect it to be particularly so for those powers that are more closely related to insulation of the Executive (the nonlegislative ones, such as the power of dissolving the assembly). This seems to be the case in the simple linear relationships of Table V. Not only does there appear to be the expected positive correlation between insulation and polarization, but also its significance actually increases when we consider specifically those powers that are more closely related to the insulation mechanisms we described. Unfortunately, the scarcity of data points does not allow us to get into such a detail for Parliamentary regimes. Similar patterns are evident, however, in additional research, not reported here. Control of the agenda timing, for example, appears to be more frequently handed over to the Government, as opposed to the Parliament, in more fractionalized countries. Table VII concludes our empirical overview focusing on Electoral Rules. The unconditional results of Table II are confirmed in the signs of the coefficients sign (Plurality systems are chosen wherever the population is more fractionalized), but the results are less robust. This result is in direct contrast with studies limited to a smaller number of countries (particularly democracies) suggesting a positive association between ethnic fragmentation and proportional representation as in Lijphart [1994], who studies a small group of advanced democracies.²⁹

Overall, we find significant evidence that various indices of insulations are positively correlated with measure of fractionalization and polarization. Thus, more polarized societies tend to have more "insulated" rulers. Also, forms of government appear to be endogenous to ethnic fractionalization.

29. These results are robust to controlling for various other variables including the fraction of population above 65, fraction of urban population, fraction of population in agriculture, and life expectancy. These are all variables highly correlated with GDP per capita. All these sensitivity tests are available upon request.

TABLE IV
SEPARATION OF POWERS AND POLARIZATION

	ORDERED PROBIT			
	(1)	(2)	(3)	(4)
	Separation of powers (PRES, 1990)	Separation of powers (PRES, 1990)	Separation of powers (PRES, 1990)	Separation of powers (PRES, 1990)
Ethnic	1.964	1.724	1.384	1.256
Fractionalization	(0.390)***	(0.464)***	(0.500)***	(0.535)**
Index	[141]	[140]	[141]	[140]
Ethno-Linguistic	1.153	1.357	0.714	0.969
Fractionalization	(0.392)***	(0.428)***	(0.502)	(0.485)**
Index 1960	[106]	[106]	[106]	[106]
Polarization (alpha = 4/5)	4.731	3.5	3.301	2.603
	(1.451)***	(1.633)**	(1.499)**	(1.629)
	[140]	[139]	[140]	[139]
Linguistic	0.938	0.932	0.5	0.55
Fractionalization	(0.326)***	(0.356)***	(0.430)	(0.428)
Index	[135]	[134]	[135]	[134]
Control sets				
Legal origin		Included [0.000]		Included [0.000]
Regional dummies			Included [0.044]	Included [0.190]
Colonial origin				
Religion				
Log(Real GDP) in 1960				
Marginal effect at mean from partly free to not free status	0.782	0.685	0.551	0.499

V.C. Insulation in Times of Crisis

A "crisis" can be defined as a situation in which a policy action is especially desirable, even though not everybody may benefit equally from such action. In our model, then, we can

TABLE IV
(CONTINUED)

ORDERED PROBIT				
(5) Separation of powers (PRES, 1990)	(6) Separation of powers (PRES, 1990)	(7) Separation of powers (PRES, 1990)	(8) Separation of powers (PRES, 1990)	(9) Separation of powers (PRES, 1990)
1.642 (0.457)*** [140]	1.485 (0.539)*** [140]	1.704 (0.406)*** [139]	0.957 (0.525)* [139]	1.265 (0.468)*** [109]
1.236 (0.515)** [106]	0.929 (0.622) [106]	1.704 (0.432)*** [106]	1.043 (0.579)* [106]	0.391 (0.439) [103]
3.787 (1.584)** [139]	3.437 (1.598)** [139]	3.475 (1.482)** [138]	1.684 (1.596) [138]	3.391 (1.583)** [108]
0.983 (0.399)** [134]	0.735 (0.474) [134]	1.104 (0.342)*** [133]	0.642 (0.502) [133]	0.269 (0.412) [105]
Included [0.000]	Included [0.801] Included [0.000]	Included [0.000]	Included [0.060] Included [0.000]	Included [0.000]
0.653	0.591	0.678	0.381	0.503

Variables are defined in Table I. Each column in the table reports Ordered Probit coefficients, robust standard errors (in parentheses, below coefficient estimates) and number of observations (in brackets, below) for the measures of polarization in society described in Table I. The table includes *p*-values for Chi-square test of joint significance of the control sets described in Table I. The marginal effects and *p*-values reported refer to the specification employing the Ethnic Fractionalization Index of Alesina et al. [2004]. * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent.

interpret a "crisis" as a situation where γ is especially high. A straightforward implication of our comparative static analysis is that one should observe a movement toward more insulation in times of emergency. One extreme example is wartime, when,

TABLE V
EXECUTIVE CONSTRAINTS AND POLARIZATION

	OLS			
	(1) Executive constraints	(2) Executive constraints	(3) Executive constraints	(4) Executive constraints
Ethnic	-3.768	-3.681	-2.633	-1.748
Fractionalization	(0.619)***	(0.740)***	(0.843)***	(0.863)**
Index	[121]	[113]	[121]	[113]
	0.2	0.25	0.28	0.4
Ethno-Linguistic	-2.869	-2.737	-0.593	-0.437
Fractionalization	(0.691)***	(0.769)***	(0.744)	(0.788)
Index 1960	[104]	[104]	[104]	[104]
	0.14	0.19	0.32	0.36
Polarization (alpha = 4/5)	-7.182	-4.041	-6.142	-2.372
	(2.368)***	(2.684)	(2.324)***	(2.398)
	[121]	[113]	[121]	[113]
	0.06	0.1	0.26	0.37
Linguistic	-2.742	-2.688	-1.196	-0.605
Fractionalization	(0.601)***	(0.650)***	(0.783)	(0.785)
Index	[119]	[111]	[119]	[111]
	0.13	0.21	0.22	0.36
Control sets				
Legal origin		Included [0.070]		Included [0.022]
Regional dummies			Included [0.001]	Included [0.000]
Colonial origin				
Religion				
Log(Real GDP) in 1960				

often, democratic rule is limited and even democratic countries adopt a more hierarchical structure of power. In the terminology of our model, one can think of "winning a war" as a policy with a very high γ requiring a very high degree of insulation of leaders.

Less extreme examples involve reforms of economic institutions. For instance, often Central Banks have been made more

TABLE V
(CONTINUED)

OLS				
(5) Executive constraints	(6) Executive constraints	(7) Executive constraints	(8) Executive constraints	(9) Executive constraints
-2.988 (0.719)*** [113] <i>0.32</i>	-1.803 (0.895)** [113] <i>0.38</i>	-3.135 (0.612)*** [112] <i>0.33</i>	-1.219 (0.838) [112] <i>0.44</i>	-1.99 (0.669)*** [105] <i>0.42</i>
-1.943 (0.745)** [104] <i>0.34</i>	-0.472 (0.845) [104] <i>0.41</i>	-2.388 (0.663)*** [104] <i>0.3</i>	-0.362 (0.658) [104] <i>0.45</i>	-1.074 (0.643)* [100] <i>0.4</i>
-3.842 (2.549) [113] <i>0.23</i>	-2.617 (2.386) [113] <i>0.36</i>	-3.75 (2.281) [112] <i>0.21</i>	-0.489 (2.286) [112] <i>0.42</i>	-1.635 (2.147) [105] <i>0.37</i>
-2.035 (0.629)*** [119] <i>0.29</i>	-0.695 -0.826 [111] <i>0.35</i>	-2.381 (0.589)*** [110] <i>0.31</i>	-0.714 -0.706 [110] <i>0.43</i>	-1.056 (0.630)* [102] <i>0.38</i>
Included [0.003]	Included [0.011] Included [0.282]	Included [0.000]	Included [0.009] Included [0.001]	Included [0.000]

Variables are defined in Table I. Each column in the table reports OLS coefficients, robust standard errors (in parentheses, below coefficient estimates), number of observations (in brackets, below), and R^2 s (in italics, further below) for the measures of polarization in society described in Table I. The table includes p -values for F -test of joint significance of the control sets described in Table I. The p -values reported refer to the specification employing the Ethnic Fractionalization Index of Alesina et al. [2004]. * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent.

independent, in order to "insulate" monetary policy, in periods of very high inflation, that is in periods where anti-inflationary policies have an especially high γ . The most famous example involves the Bundesbank and the German hyperinflation. The recent adoption of fiscal rules with the European Union that limit the discretion of fiscal decisions on budget deficits can also be

TABLE VI
POWERS OF THE PRESIDENCY AND POLARIZATION

	OLS				
	(1)	(2)	(3)	(4)	(5)
	Total powers of the presidency	Total powers of the presidency	Total powers of the presidency	Total powers of the presidency	Total powers of the presidency
Ethnic	7.164	7.723	5.523	6.887	5.269
Fractionalization	(3.940)*	(5.322)	(6.326)	(4.359)	(3.341)
Index	[31]	[31]	[31]	[30]	[56]
	0.10	0.19	0.33	0.15	0.03
Ethno-Linguistic	4.321	5.092	3.928	3.753	4.321
Fractionalization	(3.281)	(4.305)	(4.231)	(3.648)	(3.281)
Index 1960	[30]	[30]	[30]	[30]	[30]
	0.04	0.15	0.32	0.09	0.04
Polarization (alpha = 4/5)	31.057	31.841	21.929	4.152	17.824
	(10.556)***	(13.776)**	(13.615)	(3.145)	(10.085)*
	[31]	[31]	[31]	[28]	[56]
	0.26	0.30	0.39	0.21	0.06
Linguistic	4.484	8.123	7.959	29.898	2.161
Fractionalization	(2.918)	(4.019)*	(3.356)**	(11.064)**	(3.063)
Index	[29]	[29]	[29]	[30]	[53]
	0.06	0.30	0.56	0.29	0.01
Control sets					
Legal origin	Included [0.240]				
Regional dummies	Included [0.000]				
Log(Real GDP) in 1960	Included [0.296]				
Sample	Shugart and Carey [1992]	Shugart and Carey [1992]	Shugart and Carey [1992]	Shugart and Carey [1992]	Shugart and Carey [1992] and NCSEER

seen as a response to the fiscal crises of the 1980s and 1990s. In Latin America several institutional reforms leading to more "insulation" of monetary and fiscal policy from the ebb and flow of changing political majorities have followed the "lost decade" of the 1980s.

TABLE VI
(CONTINUED)

OLS				
(6)	(7)	(8)	(9)	(10)
Nonlegislative (checks and balances) powers of the presidency	Nonlegislative (checks and balances) powers of the presidency	Nonlegislative (checks and balances) powers of the presidency	Nonlegislative (checks and balances) powers of the presidency	Nonlegislative (checks and balances) powers of the presidency
5.566 (2.665)** [31] <i>0.13</i> 3.928 (2.248)* [30] <i>0.07</i> 20.137 (7.369)** [31] <i>0.22</i> 3.843 (1.948)* [29] <i>0.09</i>	5.765 (3.993) [31] <i>0.19</i> 4.395 (3.195) [30] <i>0.17</i> 19.559 (10.900)* [31] <i>0.25</i> 6.16 (3.380)* [29] <i>0.33</i>	3.456 (4.703) [31] <i>0.29</i> 3.809 (2.969) [30] <i>0.31</i> 12.819 (10.188) [31] <i>0.33</i> 6.537 (2.135)*** [29] <i>0.59</i>	5.522 (2.981)* [30] <i>0.14</i> 3.686 (2.494) [30] <i>0.09</i> 3.736 (2.176)* [28] <i>0.18</i> 19.677 (7.936)** [30] <i>0.23</i>	4.545 (2.286)* [56] <i>0.05</i> 3.928 (2.248)* [30] <i>0.07</i> 12.74 (6.740)* [56] <i>0.06</i> 1.733 (2.138) [53] <i>0.01</i>
	Included [0.321]	Included [0.023]	Included [0.569]	
Shugart and Carey [1992]	Shugart and Carey [1992]	Shugart and Carey [1992]	Shugart and Carey [1992]	Shugart and Carey [1992] and NCSEER

Variables are defined in Table I. Each column in the table reports OLS coefficients, robust standard errors (in parentheses, below coefficient estimates), number of observations (in brackets, below), and R^2 s (in italics, further below) for the measures of polarization in society described in Table I. The table includes p -values for F -test of joint significance of the control sets described in Table I. The p -values reported refer to the specification employing the Ethnic Fractionalization Index of Alesina et al. [2004]. * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent.

An even more extreme case of a crisis is a war. We can interpret winning a war as a "policy" which is considered essential by most, so a war implies a large increase in γ . It is generally believed that during wars it is necessary to increase the executive power of unrestricted action and even temporarily suspend cer-

TABLE VII
ELECTORAL RULE AND POLARIZATION

	PROBIT			
	(1) Plurality rule	(2) Plurality rule	(3) Plurality rule	(4) Plurality rule
Ethnic Fractionalization Index	1.071 (0.488)** [109]	0.997 (0.565)* [109]	0.351 (0.611) [109]	0.186 (0.65) [109]
Ethno-Linguistic Fractionalization Index 1960	1.481 (0.479)*** [95]	1.031 (0.541)* [95]	0.651 (0.588) [95]	0.065 (0.650) [95]
Polarization ($\alpha = 4/5$)	2.716 (1.588)* [108]	2.336 (1.844) [108]	1.493 (1.788) [108]	1.248 (2.008) [108]
Linguistic Fractionalization Index	0.94 (0.427)** [104]	0.726 (0.462) [104]	-0.251 (0.576) [104]	-0.594 (0.614) [104]
Control sets				
Legal origin		Included [0.002]		Included [0.002]
Regional dummies			Included [0.048]	Included [0.031]
Colonial origin				
Religion				
Log(Real GDP) in 1960				
Marginal effect at mean from partly free to not free status	0.408	0.376	0.133	0.070

tain types of checks and balances. The army itself has a very "insulated" constitution; that is, nobody can question directives from superior officers. In fact, the case of wars may be one example in which Constitutions can be made contingent on one particular event, namely war. So the Constitution can prescribe special and more insulated procedures in times of declared wars.

TABLE VII
(CONTINUED)

PROBIT				
(5) Plurality rule	(6) Plurality rule	(7) Plurality rule	(8) Plurality rule	(9) Plurality rule
0.749 (0.572) [109]	0.200 (0.66) [109]	0.877 (0.518)* [108]	0.133 (0.638) [108]	1.051 (0.565)* [96]
0.966 (0.553)* [92]	0.392 (0.696) [92]	1.205 (0.513)** [95]	0.566 (0.621) [95]	1.357 (0.540)** [93]
2.426 (1.815) [108]	1.294 (1.948) [108]	2.690 (1.698) [107]	1.224 (1.861) [107]	2.809 (1.748) [95]
0.496 (0.464) [104]	-0.296 (0.630) [104]	0.649 (0.461) [103]	-0.218 (0.604) [103]	0.901 (0.492)* [93]
Included [0.000]	Included [0.312] Included [0.001]	Included [0.003]	Included [0.242] Included [0.026]	Included [0.115]
0.275	0.073	0.331	0.050	0.402

Variables are defined in Table I. Each column in the table reports Probit coefficients, robust standard errors (in parentheses, below coefficient estimates) and number of observations (in brackets, below) for the measures of polarization in society described in Table I. The table includes *p*-values for Chi-square test of joint significance of the control sets described in Table I. The marginal effects and *p*-values reported refer to the specification employing the Ethnic Fractionalization Index of Alesina et al. [2004]. * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent.

VI. CONCLUSIONS

This paper has moved some steps forward in analyzing the "endogenous choice of political institutions." We have focused on one important, and general question of institution design, namely how insulated political leaders are expected to be ex

post, or to put in reverse, how large the (super)majority should or will be to pass legislation. Rather than reviewing our results, we close by highlighting a few directions of further research.

One is to investigate other aspects of institutional design, for instance, term limits as another form of insulation. A leader facing short term limits may not feel particularly interested in putting effort into policy reforms, especially if they require "time to build." On the other hand, without term limits incumbents may achieve an entrenched power structure and restrict political competition. Once again, the Founding Fathers had captured the essence of the problem of term duration. In *The Federalist Paper* No. 71, in fact, Hamilton puts it beautifully by writing that "It may be asked also whether a duration of four years would answer the end proposed; and if it would not, whether a less period, which would at least be recommended by greater security against ambitious design would be too short for the purpose of inspiring the desired fairness and independence of the magistrate."

An important question related to insulation is the choice of electoral rules, majoritarian, proportional, etc. In order to properly address this issue, one needs a richer model of voting, rather than the simple referendum type structure that we used here.

A third extension could explore the issue of entry of politicians and their quality.³⁰ First, voters may adjust whom they select as their leader as a function of how much the leader himself is insulated. Different politicians may be chosen in different types of systems. Also the nature of insulation might affect the entry decision of potential leaders. High quality candidates may opt out if they feel that they have no real power when in office.

APPENDIX 1: OPTIMALITY OF THE SIMPLE MAJORITY RULE UNDER RISK NEUTRALITY AND NO EXPROPRIATION: THE BASIC INTUITION³¹

Suppose that there were only two alternatives, x and y , to be chosen between ex post. Ex ante the individuals in the constituency (of size normalized to 1) are under the veil of ignorance and

30. For a recent discussion of the quality of politicians, see Caselli and Morelli [2002].

31. This example was kindly provided to us by Matthew Jackson, and it builds on Rae [1969].

do not know whether they will prefer x or y . Suppose that k is the number of individuals who prefer x to y . If an individual has ex post income α if her preferred alternative is selected and income $(-\beta)$ if the other alternative is chosen, then under risk neutrality the ex ante total utility of choosing alternative x , is equal to

$$U(x) = \alpha k - \beta(1 - k);$$

similarly,

$$U(y) = -\beta k + \alpha(1 - k)$$

if alternative y is chosen. Choosing $M = 1/2$ will then guarantee that the alternative that maximizes total ex ante utility is always chosen, namely x whenever $k > 1/2$, and y otherwise. This reasoning extends to collective decision problems like ours that boils down to a utilitarian maximization problem: if $M > 1/2$ (respectively, $M < 1/2$), then reforms would take place too (respectively, not sufficiently) often from the standpoint where voters expect their preferences for reform to lie ex post.

APPENDIX 2: PROOFS OF PROPOSITIONS

Generalization of Proposition 1

Let us consider $a \sim g(a)$, $a \in [-A, A]$, where $g(a) = dG(a)/da$ and G is the cumulative distribution function for the shock a , and $\lambda_i \sim f(\lambda_i)$, $\lambda_i \in [\underline{\lambda}, \bar{\lambda}]$ and $A > 0$, $\bar{\lambda} > \underline{\lambda}$, $\gamma > 0$. For simplicity let us fix $p = 1$ in this analysis. The maximization problem for the voter under a veil of ignorance is

$$\begin{aligned} & \max \left\{ \int_{-A}^{\bar{\lambda} - \underline{\lambda} - LM} \int_{\underline{\lambda}}^{\bar{\lambda}} f(\lambda_i) g(a) d\lambda_i da \right. \\ & \quad \left. + \int_{\bar{\lambda} - \underline{\lambda} - LM}^A \int_{\underline{\lambda}}^{\bar{\lambda}} \gamma(\lambda_i + a) f(\lambda_i) g(a) d\lambda_i da \right. \\ & = \max \{ G(\bar{\lambda} - \underline{\lambda} - LM) - G(-A) + (G(A) \\ & \quad - G(\bar{\lambda} - \underline{\lambda} - LM)) E\lambda_i \gamma + \gamma(AG(A) \\ & \quad - (\bar{\lambda} - \underline{\lambda} - LM)G(\bar{\lambda} - \underline{\lambda} - LM)) - \gamma \int_{\bar{\lambda} - \underline{\lambda} - LM}^A G(a) da, \end{aligned}$$

where we make straightforward use of integration by parts and E is the expectation operator. Now, by imposing the first-order conditions, we obtain

$$M^* = (E\lambda_i - \underline{\lambda})/(\bar{\lambda} - \underline{\lambda}),$$

which corresponds to $1/2$ for $f(\lambda_i)$ uniform.

Proof of Proposition 2

Suppose that whenever $(\lambda_i + a)\gamma < \theta$, where $\theta \leq 0$, individual i incurs a utility loss of $-u$. Recall that the indifference voter between reform and no reform, satisfies $\lambda_i + a = \hat{\lambda} = 1/\gamma$. The ex ante maximization problem at the constitutional stage now becomes

$$\begin{aligned} \max_M \left\{ p \int_{-A}^{\hat{\lambda} - \underline{\lambda} - LM} \frac{1}{2A} da - up \int_{\hat{\lambda} - \underline{\lambda} - LM}^A \left(\int_{\underline{\lambda}}^{\theta/\gamma - a} \frac{1}{l} d\lambda_i \right) \frac{1}{2A} da \right. \\ \left. + p \int_{\hat{\lambda} - \underline{\lambda} - LM}^A (\lambda_m + a)\gamma \frac{1}{2A} da - (1-p)Mb \right\}. \end{aligned}$$

Rewriting the middle term in u as

$$\begin{aligned} -up \int_{\hat{\lambda} - \underline{\lambda} - LM}^A \left(\int_{\underline{\lambda}}^{\theta/\gamma - a} \frac{1}{l} d\lambda_i \right) \frac{1}{2A} da \\ = \frac{-up}{2Al} \left[\left(\frac{\theta}{\gamma} - \underline{\lambda} \right) (A - (\hat{\lambda} - \underline{\lambda} - LM)) - \frac{1}{2} (A^2 - (\hat{\lambda} - \underline{\lambda} - LM)^2) \right], \end{aligned}$$

we can reexpress the original problem as

$$\begin{aligned} \max_M \left\{ \frac{p}{2A} (\hat{\lambda} - \underline{\lambda} - LM - A) + \frac{p}{2A} \lambda_m \gamma (A - (\hat{\lambda} - \underline{\lambda} - LM)) \right. \\ \left. + \frac{p}{2A} \gamma \frac{1}{2} (A^2 - (\hat{\lambda} - \underline{\lambda} - LM)^2) - \frac{up}{2Al} \left[\left(\frac{\theta}{\gamma} - \underline{\lambda} \right) (A - (\hat{\lambda} - \underline{\lambda} - LM)) \right. \right. \\ \left. \left. - \frac{1}{2} (A^2 - (\hat{\lambda} - \underline{\lambda} - LM)^2) \right] - (1-p)bM \right\}. \end{aligned}$$

Taking first-order conditions with respect to M , we obtain

$$G(u, M) = \gamma l (\lambda_m - \underline{\lambda} - LM) - u \left[\frac{\theta}{\gamma} - \hat{\lambda} + LM \right] - \frac{1-p}{p} 2Ab = 0.$$

The optimal degree of insulation is

$$(A1) \quad M^* = \frac{\gamma l(\lambda_m - \underline{\lambda}) + u(1 - \theta)/\gamma - 2Ab(1 - p)/p}{(\gamma l + u)l}.$$

We can easily verify now the comparative statics $dM^*/du < 0$. To see this, we use the fact that u only enters the maximization program if and only if $\theta/\gamma - \underline{\lambda} > \hat{\lambda} - \underline{\lambda} - lM$. We then have

$$\frac{dM^*}{du} = -\frac{\partial G}{\partial u} \bigg/ \frac{\partial G}{\partial M} = -\frac{\theta/\gamma - \hat{\lambda} + lM}{(\gamma l + u)l} < 0,$$

which establishes the proposition.

Proof of Proposition 3

With polarization at the lower end of the preference interval and risk aversion as in the previous proposition, the ex ante maximization problem at the constitutional stage, now becomes

$$\begin{aligned} \max_M \left\{ p \int_{-A}^{\hat{\lambda} - \underline{\lambda} - (M - \Delta)l/(1 - \Delta)} \frac{1}{2A} da \right. \\ \left. - up \int_{\hat{\lambda} - \underline{\lambda} - (M - \Delta)l/(1 - \Delta)}^A \left(\Delta + \int_{\hat{\lambda}}^{\theta/\gamma - a} \frac{(1 - \Delta)}{l} d\lambda_i \right) \frac{1}{2A} da \right. \\ \left. + p \int_{\hat{\lambda} - \underline{\lambda} - (M - \Delta)l/(1 - \Delta)}^A \left(\lambda_m - \frac{\Delta l}{2} + a \right) \gamma \frac{1}{2A} da - (1 - p)Mb \right\}. \end{aligned}$$

Taking first-order conditions with respect to M , we obtain

$$\begin{aligned} \gamma \left(\lambda_m - \frac{\Delta l}{2} - \underline{\lambda} - \frac{(M - \Delta)l}{1 - \Delta} \right) \frac{l}{1 - \Delta} \\ - u \left(\frac{\theta}{\gamma} - \hat{\lambda} + \frac{Ml}{(1 - \Delta)} \right) - \frac{1 - p}{p} 2Ab = 0. \end{aligned}$$

It follows that under risk aversion and polarization the optimal degree of insulation is given by

$$(8) \quad M^* = \frac{\gamma l(\lambda_m - \Delta l/2 - \underline{\lambda} + \Delta l/(1 - \Delta)) + u(\hat{\lambda} - \theta/\gamma)(1 - \Delta) - 2Ab(1 - \Delta)(1 - p)/p}{l(\gamma l/(1 - \Delta) + u)}.$$

For large u the optimal level of insulation M^* is approximately equal to

$$M^* = (1 - \Delta) \frac{\hat{\lambda} - \theta/\gamma}{l} = (1 - \Delta) \frac{1 - \theta}{\gamma l}$$

so that

$$\frac{dM^*}{d\Delta} = -\frac{1 - \theta}{\gamma l} < 0.$$

For $u = 0$, the optimal degree of insulation becomes

$$M^* = \frac{1}{2} (1 - \Delta)^2 + \Delta - \frac{1 - p}{p} 2Ab \frac{(1 - \Delta)^2}{\gamma l^2},$$

so that

$$\frac{dM^*}{d\Delta} = \Delta + \frac{1 - p}{p} 2Ab \frac{2(1 - \Delta)}{\gamma l^2} > 0.$$

The proposition then follows by continuity of $dM^*/d\Delta$ with respect to u .

Proof of Proposition 4

A policy reform will pass with compensation paid if and only if

$$(1 + k)c(a) \leq \omega$$

or equivalently

$$\hat{\lambda} - \underline{\lambda} - lM - a \leq \left(\frac{2l\omega}{(1 + k)\gamma} \right)^{1/2}$$

given that

$$c(a) = \int_{\underline{\lambda} + lM}^{\hat{\lambda} - a} \frac{(\hat{\lambda} - a - \lambda_i)\gamma}{l d\lambda_i} = \frac{\gamma}{2l} (\hat{\lambda} - a - \underline{\lambda} - lM)^2.$$

Two cases can be considered:

(1) $\hat{\lambda} - \underline{\lambda} - lM^* + A < (2l\omega/(1 + k)\gamma)^{1/2}$, which will be true whenever ω is sufficiently large (i.e., enough funds have been raised); in this case reform will always take place (as it will always be affordable) and, at the constitutional stage behind a veil of ignorance, the generic individual will choose M^* in order to maximize

$$\max \{p(\lambda_m \gamma - kE_a c(a)) - (1-p)bM\},$$

where $E_a c(a)$ is the expected compensation cost, and given by

$$E_a c(a) = \int_{-A}^{\hat{\lambda} - \underline{\lambda} - lM} \frac{\gamma(\hat{\lambda} - \underline{\lambda} - lM - a)^2}{2l} \frac{1}{2A} da$$

$$= \frac{\gamma(\hat{\lambda} - \underline{\lambda} - lM + A)^3}{12Al}.$$

The solution of this problem is

$$(9) \quad M_{(1)}^* = \frac{\hat{\lambda} - \underline{\lambda} + A - 2\sqrt{(Ab(1-p)/p\gamma k)}}{l}.$$

A sufficient condition for individuals to opt for compensations at the constitutional stage instead of the no-compensation solution analyzed in the previous section, is obtained by comparing utility levels achieved under the two systems. One can show that utility under compensation is not defined for $k = 0$, but it is continuous, monotonic, strictly decreasing in k for any $k > 0$. If we consider the limit as $k \rightarrow 0$, it is possible to show that it diverges to $+\infty$ while utility without compensation is finite. Hence, there exists a cutoff level \bar{k} such that compensation will be a viable alternative whenever $k \in (0, \bar{k}]$.

(2) $\hat{\lambda} - \underline{\lambda} - lM^* + A > (2l\omega/(1+k)\gamma)^{1/2}$ identifies the second case, when not enough resources can be raised to fully compensate losers. Hence, the problem for the voter becomes

$$(10) \quad \max_M \left\{ p \left(\int_{-A}^{\hat{\lambda} - \underline{\lambda} - lM - (2l\omega/(1+k)\gamma)^{1/2}} \frac{1}{2A} da \right. \right.$$

$$+ \int_{\hat{\lambda} - \underline{\lambda} - lM - (2l\omega/(1+k)\gamma)^{1/2}}^A (\lambda_m + a)\gamma \frac{1}{2A} da$$

$$\left. \left. - k \frac{\gamma}{12Al} \left(\frac{2l\omega}{(1+k)\gamma} \right)^{3/2} \right) - (1-p)bM \right\},$$

where the third term in the parentheses multiplied by p is the expected deadweight loss from compensation, calculated as

$$E_a c(a) = \frac{\gamma}{2l} \int_{\hat{\lambda} - \underline{\lambda} - lM - (2l\omega/(1+k)\gamma)^{1/2}}^{\hat{\lambda} - \underline{\lambda} - lM} (\hat{\lambda} - \underline{\lambda} - lM - a)^2 \frac{1}{2A} da$$

$$= \frac{\gamma}{12Al} \left(\frac{2l\omega}{\gamma(1+k)} \right)^{3/2},$$

while the first two terms represent the expected income level. The maximization problem implies that

$$(11) \quad M_{(2)}^* = \frac{1}{2} - \frac{2Ab(1-p)/p}{l^2\gamma} - \left(\frac{2\omega}{l\gamma(1+k)} \right)^{1/2}.$$

A sufficient condition of the type derived above for the first case can be derived for this second case as well.

Finally, it is immediate to see that both $M_{(1)}^*$ and $M_{(2)}^*$ satisfy the conditions stated in the proposition.

Proof of Proposition 5

We want to show that in a population symmetrically polarized and risk averse, if the minority sitting at the Constitutional table, C_ε , know that their type λ is distributed over the interval $[\bar{\lambda} - \varepsilon, \bar{\lambda}]$ with $\bar{\lambda} - \varepsilon > \underline{\lambda}$, then

1. for all ε the level of insulation M_ε chosen by this minority is greater than the optimal level M^* chosen under the veil of ignorance;
2. for ε sufficiently small, constitution writers in C_ε react to an increase in polarization Δ by always increasing insulation M_ε .

First, note that the ex ante maximization problem faced by the constitutional minority, can be written as

$$(12) \quad \max_M \left\{ p \int_{-A}^{\hat{\lambda} - \underline{\lambda} - (M - \Delta)l/(1 - \Delta)} \frac{1}{2A} da \right.$$

$$- up \int_{\hat{\lambda} - \underline{\lambda} - (M - \Delta)l/(1 - \Delta)}^A \left(\int_{\bar{\lambda} - \varepsilon}^{\theta/\gamma - a} \frac{(1 - \Delta)}{l} d\lambda_i \right) \frac{1}{2A} da$$

$$\left. + p \int_{\hat{\lambda} - \underline{\lambda} - (M - \Delta)l/(1 - \Delta)}^A (\xi[\varepsilon] + a)\gamma \frac{1}{2A} da - (1 - p)Mb \right\},$$

where

$$\xi[\varepsilon] = E[\lambda_i | i \in C] = \bar{\lambda} - \varepsilon/2$$

is the average idiosyncratic benefit from reform among individuals in the minority.

Taking the first-order condition for the above program, we obtain

$$\gamma \left(\frac{\bar{\lambda} - \varepsilon}{2 - \bar{\lambda}} - \frac{(M - \Delta)l}{1 - \Delta} \right) \frac{l}{(1 - \Delta)} - u \max \left(0, \left(\frac{\theta}{\gamma} - \hat{\lambda} - l + \varepsilon + \frac{l(M - \Delta)}{1 - \Delta} \right) \right) - \frac{1 - p}{p} 2Ab = 0,$$

and therefore,

$$(13) \quad M_\varepsilon = \frac{1}{l(\gamma l/(1 - \Delta) + u)} \left[\gamma l \left(l - \frac{\varepsilon}{2} + \frac{\Delta l}{(1 - \Delta)} \right) + u \max \left(0, \left(\hat{\lambda} - \frac{\theta}{\gamma} + l - \varepsilon \right) (1 - \Delta) + l\Delta \right) - \frac{1 - p}{p} 2Ab(1 - \Delta) \right].$$

That M_ε is greater than the corresponding rule M^* under the veil of ignorance, follows immediately from the comparison between (8) and (13) together with the fact that

$$\xi[\varepsilon] = \bar{\lambda} - \varepsilon/2 > \lambda_m$$

and

$$u \left(\hat{\lambda} - \frac{\theta}{\gamma} \right) (1 - \Delta) < u \left(\left(\hat{\lambda} - \frac{\theta}{\gamma} + l - \varepsilon \right) (1 - \Delta) + l\Delta \right),$$

which implies that the minority loses less and gains more from reform than the representative individual under the veil of ignorance. This establishes the first part of the proposition.

Finally, that $dM_\varepsilon/d\Delta$ increases when ε is sufficiently small, follows immediately from the fact that in that case for all $a \in [\hat{\lambda} - \bar{\lambda} - (M - \Delta)l/(1 - \Delta), A]$, we have

$$\bar{\lambda} - \varepsilon > \theta/\gamma - a$$

when ε is small. Hence in that case the equilibrium level of insulation becomes

$$M_\varepsilon = \frac{1-\Delta}{\gamma l^2} \left[\gamma l \left(l - \frac{\varepsilon}{2} + \frac{\Delta l}{(1-\Delta)} \right) - \frac{1-p}{p} 2Ab(1-\Delta) \right].$$

Then:

$$\frac{dM_\varepsilon}{d\Delta} = 1 - \left[\frac{l - \varepsilon/2}{l} - \frac{1-p}{p} 4Ab \frac{1-\Delta}{\gamma l^2} \right] > 0,$$

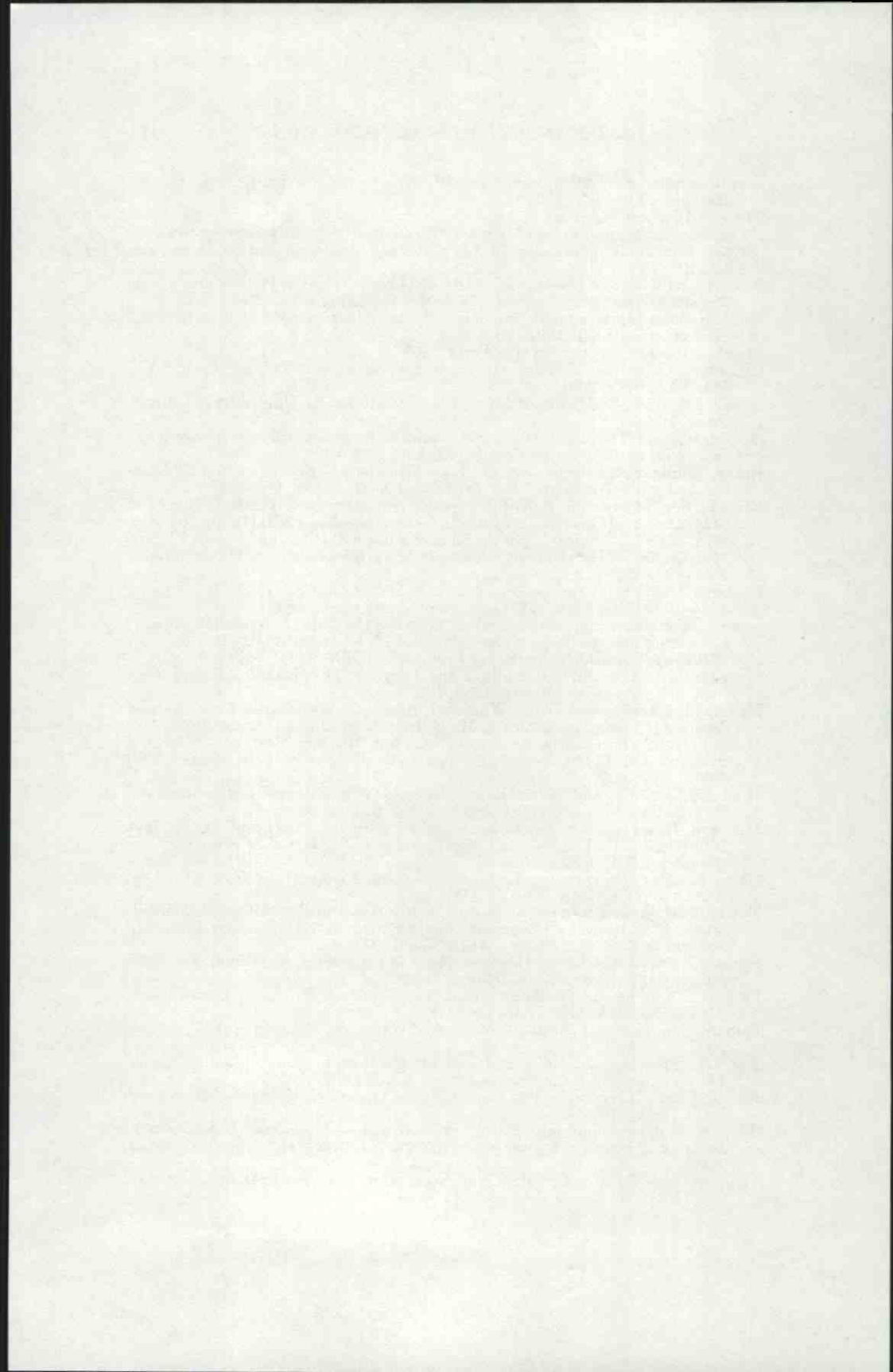
so that for sufficiently low ε the more constitution writers in the minority react to an increase in polarization by increasing insulation. This establishes the proposition.

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FOR ECONOMIC POLICY RESEARCH
HARVARD UNIVERSITY

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